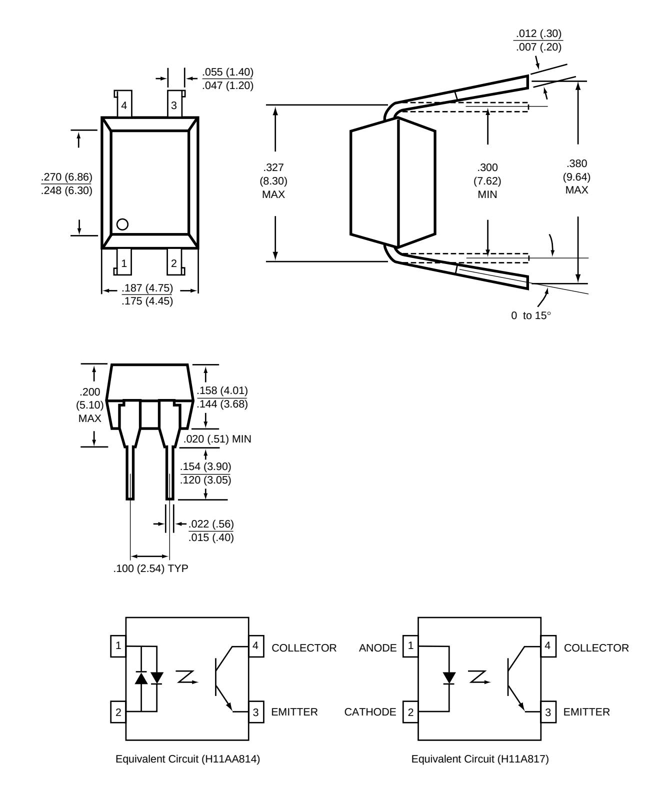


4–PIN PHOTOTRANSISTOR OPTOCOUPLERS

H11AA814 SERIES
H11A817 SERIES

PACKAGE DIMENSIONS



Equivalent Circuit (H11AA814)

Equivalent Circuit (H11A817)

NOTE: ALL DIMENSIONS ARE IN INCHES (mm)
PACKAGE CODE T

DESCRIPTION

The QT Optoelectronics H11AA814 Series consists of two gallium arsenide infrared emitting diodes, connected in inverse parallel, driving a single silicon phototransistor in a 4-pin dual in-line package.

The H11A817 Series consists of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 4-pin dual in-line package.

FEATURES

- Compact 4-pin package
- Current transfer ratio in selected groups:

H11AA814:	20-300%	H11A817:	50-600%
H11AA814A:	50-150%	H11A817A:	80-160%
		H11A817B:	130-260%
		H11A817C:	200-400%
		H11A817D:	300-600%

APPLICATIONS

H11AA814 Series

- AC line monitor
- Unknown polarity DC sensor
- Telephone line interface

H11A817 Series

- Power supply regulators
- Digital logic inputs
- Microprocessor inputs
- Industrial controls

ABSOLUTE MAXIMUM RATING

TOTAL PACKAGE

Storage temperature . . . . -55° to 150° C
Operating temperature . . . . -55° to 100° C
Lead solder temperature . . . . 260° C for 10 sec
Power dissipation . . . . 200 mW

INPUT DIODE

Power dissipation (25° C ambient) . . . . 70 mW
Derate linearly (above 25° C) . . . . 1.33 mW/° C
Continuous forward current . . . . 50 mA
Peak forward current (1 µs pulse, 300 pps) . . . . 1 A
Reverse voltage (H11A817) . . . . 5 V

OUTPUT TRANSISTOR

Power dissipation (25° C ambient) . . . . . 150 mW
Derate linearly (above 25° C) . . . . . . 2.0 mW/° C
V_{CEO} . . . . 35 V
V_{ECO} . . . . 6 V
Continuous collector current . . . . 50 mA



ELECTRO-OPTICAL CHARACTERISTICS (T_A = 25° C Unless otherwise specified)

INDIVIDUAL COMPONENT CHARACTERISTICS (Applies to all unless indicated otherwise)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward voltage						
H11A817	V_F		1.2	1.5	V	I_F = 20 mA
H11AA814	V_F		1.2	1.5	V	I_F = ±20 mA
Reverse current						
H11A817	I_R		.001	10	µA	V_R = 5 V
OUTPUT TRANSISTOR						
Breakdown voltage						
Collector to emitter	BV_{CEO}	35	100		V	I_C = 1 mA, I_F = 0
Emitter to collector	BV_{ECO}	6	10		V	I_E = 100 µA, I_F = 0
Collector dark current	I_{CEO}		.025	100	nA	V_{CE} = 10 V, I_F = 0
Capacitance	C_{CE}		8		pF	V_{CE} = 0 V, f = 1 MHz

TRANSFER CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
DC current transfer ratio						
H11AA814	CTR	20		300	%	I_F = ±1 mA, V_{CE} = 5V
H11AA814A	CTR	50		150	%	I_F = ±1 mA, V_{CE} = 5V
H11A817	CTR	50		600	%	I_F = 5 mA, V_{CE} = 5V
H11A817A	CTR	80		160	%	
H11A817B	CTR	130		260	%	
H11A817C	CTR	200		400	%	
H11A817D	CTR	300		600	%	
Saturation Voltage	$V_{CE\ (SAT)}$		0.1	0.2	V	I_F = (±)20 mA, I_C = 1 mA
Rise time (non saturated)	t_r		2.4	18	µs	I_C = 2 mA, V_{CE} = 2 V, R_L = 100 Ω
Fall time (non saturated)	t_f		2.4	18	µs	I_C = 2 mA, V_{CE} = 2 V, R_L = 100 Ω

ISOLATION CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Steady-state isolation voltage	V_{ISO}	5300			V_{RMS}	1 Minute
Isolation resistance	R_{ISO}	10^{11}			Ω	V_{I-O} = 500 VDC
Isolation capacitance	C_{ISO}		0.5		pF	V_{I-O} = Ø, f = 1 MHz



TYPICAL CHARACTERISTICS

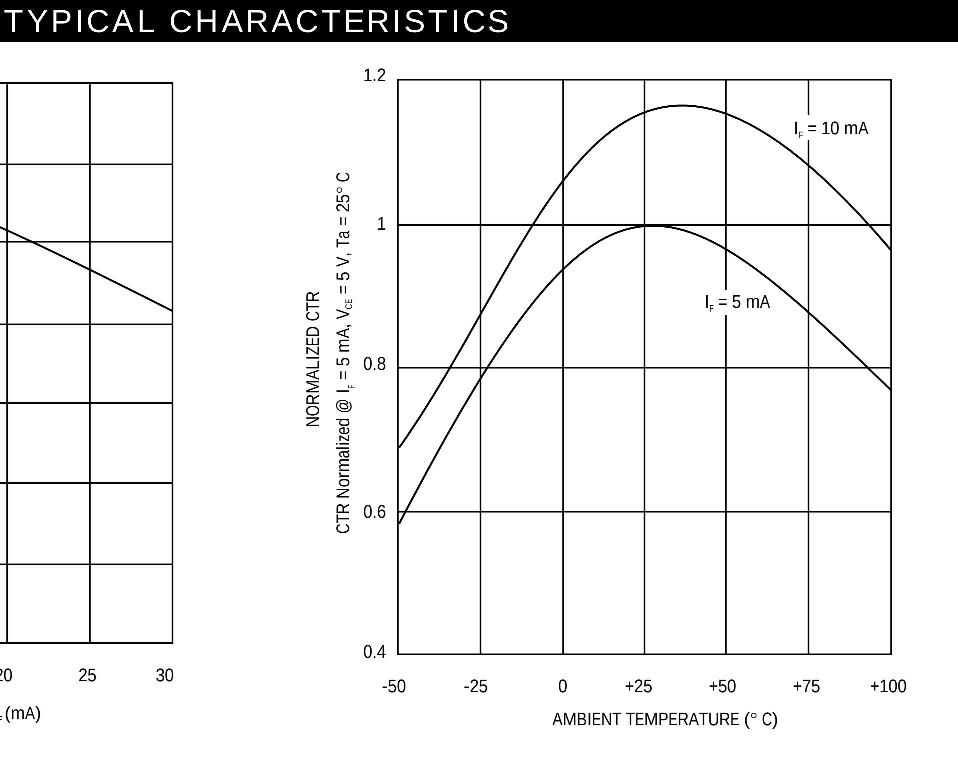




FIG. 1 - Normalized CTR vs. Forward Current

FIG. 2 - Normalized CTR vs. Ambient Temperature

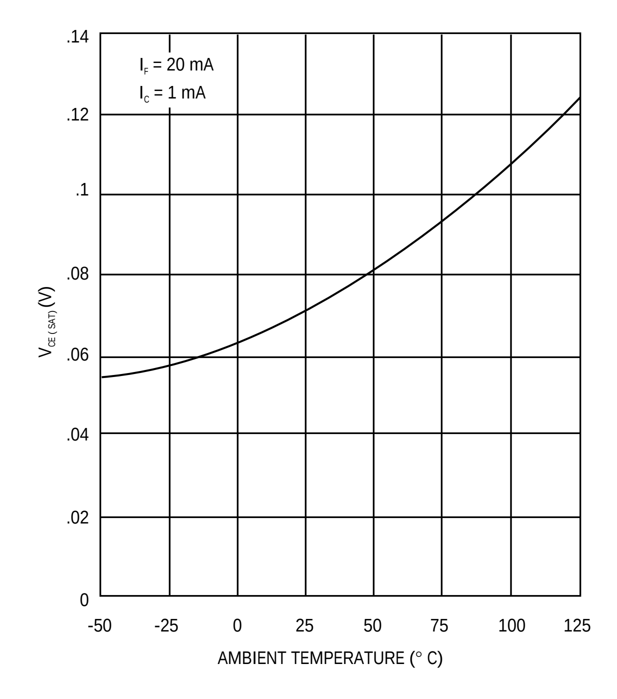


FIG. 3 - $V_{CE\ (SAT)}$ vs. Ambient Temperature

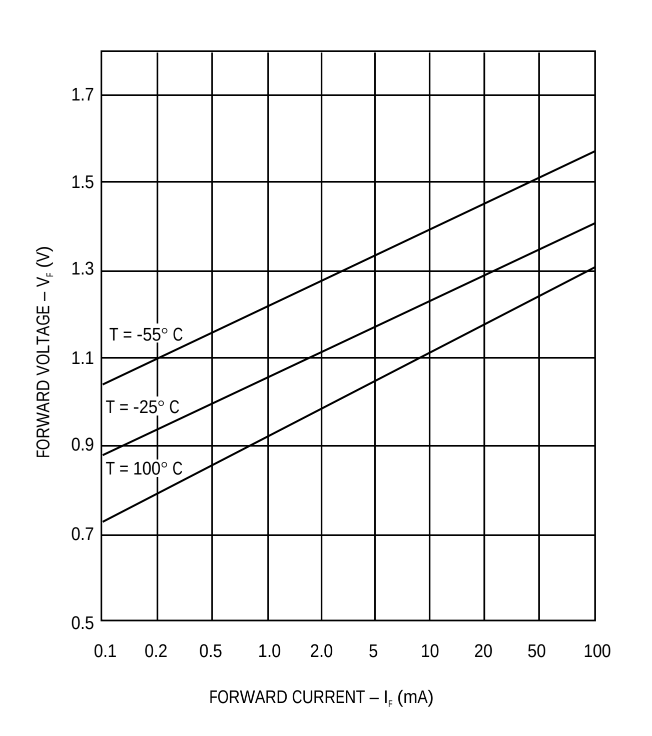


FIG. 4 - Forward Voltage vs. Forward Current

TYPICAL CHARACTERISTICS

COLLECTOR CURRENT I_C (mA)

I_F = 20 mA

I_F = 10 mA

I_F = 5 mA

I_F = 1 mA

COLLECTOR–EMITTER VOLTAGE V_{CE} (V)

FIG. 5 - Collector Current vs. Collector-Emitter Voltage

I_{CEO} (μA)

V_{CE} = 10 V

AMBIENT TEMPERATURE (° C)

FIG. 6 - Collector Leakage Current vs. Ambient Temperature

SWITCHING SPEED (μS)

I_F = 5 mA
V_{CC} = 5 V
T_a = 25° C

T_{off}

T_f

T_{on}

T_r

R-LOAD RESISTOR (k Ω)

FIG. 7 - Switching Speed vs. Load Resistor (TYP)

Call QT Optoelectronics for more information or the phone number of your nearest distributor.

United States 800-533-6786 ▪ France 33 01/43.99.25.12 ▪ Germany 49 089/96.30.51 ▪ United Kingdom 44 [0] 1296/39.44.99 ▪ Asia/Pacific 603/735-2417

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